BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	R.14-08-013 (Filed: August 14, 2014)

REPLY COMMENTS OF THE WORLD BUSINESS ACADEMY RE QUESTIONS POSED IN THE ORDER INSTITUTING RULEMAKING

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In accordance with the provisions of Rule 1.4 of the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission") and with ALJ Gamson's Ruling of September 19, 2014, which granted the parties until today to file their Reply Comments on the questions set forth in the Commission's Order Instituting Rulemaking, the World Business Academy ("Academy") hereby provides its Reply Comments in response to a number of points made by other parties in their initial Comments to said questions.

The following comments are not intended to be exhaustive, and our failure to note points other than those noted below (whether made by the five entities whose comments we generally endorse or by any of the other commenting parties) does not mean that the Academy disagrees with such statements. Rather, we have focused on specifically endorsing what we believe to be the most salient points made by the five parties whose comments we generally support. In other words, these are the key issues that the

Commission needs to keep at the center of its attention as it moves forward to structure the distributed resources planning process that it intends its regulated utilities to carry out.

These salient points made by other parties that the Academy endorses herein can be grouped into a set of seven common themes. However, in considering how best to implement these themes, the Commission must remember that the overall objective of state policy is to reduce greenhouse emissions by 80 percent or more. Moreover, given the recent startling revelations in the press about the impacts of greenhouse gas emission that are already much more severe than we had realized, as well as the devastating, persistent drought that the state has been experiencing, the Commission should do everything in its power to accelerate the transition to renewables, especially distributed renewables, as quickly as possible. Such an accelerated transition can come to pass by the rapid adoption of microgrids, as the Academy recommended in its Opening Comments in this proceeding.

The seven common themes that the Academy recommends as the basis for Commission action are as follows:

1. The Commission must provide the widest possible latitude for customer choice and control in installing Distributed Energy Resources ("DERs");

2. The Commission's jurisdictional utilities ("IOUs") must actively engage its stakeholders in the Distributed Resources Planning ("DRP") process;

3. The IOUs must be directed to develop both short and long-term DER plans, with regular updates for stakeholder and Commission review and Commission approval;

4. The IOUs' DRPs must allow for increased third-party ownership of distribution infrastructure;

5. DRPs must explicitly recognize and incorporate social and environmental values and objectives, in particular, the need for the state to transition away from energy resources relying on fossil fuels as quickly as possible;

6. DRPs must focus on the importance of developing local distribution reliability services; and

7. DRPs need to maintain a level playing field (*i.e.*, provide for competitive neutrality).

I. REPLY COMMENTS ADDRESSING THE COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR ("CAISO")

The Academy generally supports the Comments filed in this matter by the CAISO, and offers the following specific observations in response to those comments.

A. Questions of Responsibility and Accountability for Reliability

The CAISO's Comments pose the questions of whether service reliability will remain a public good and how the responsibility for service reliability should be allocated, enforced and maintained.[1] The Academy believes that service reliability should always be considered a public good with high, system-wide standards. Under our proposed network of interconnected microgrids, primary responsibility to the end user for service reliability should be placed on the shoulders of the Distribution System Operator ("DSO"), who will be required to maintain a constant, transparent dialogue with the CAISO regarding: (a) the needs of the individual microgrids under its purview for energy

[1] See, page 5 of the CAISO's Comments.

from the transmission grid, and (b) the availability from such microgrids of excess power for sale to other microgrids operating within the transmission grid currently controlled by the CAISO or to entities outside of that grid.

Thus, although the ultimate responsibility for the reliability of power supplies within each microgrid should be allocated to the DSO, the responsibility for managing the flows of power coming into and flowing out of each such microgrid should be allocated to the CAISO. Seamless coordination can only be achieved through the establishment of strict transaction parameters emphasizing resource deliverability and effectiveness (*i.e.*, transactions with near certainty of delivery). This will require each microgrid to function with a high degree of reliability by working within its projected net surplus power when offering such excess power to the transmission grid. In such cases, any net unallocated surplus power remaining after such transmissions should be redirected to the microgrid's internal storage capacity.

The new paradigm for customer service reliability that the CAISO poses as a foundational issue should therefore include, as an absolute priority, the establishment of protocols ensuring that: (1) individual microgrids are able to meet the demands of end users within their respective footprints, and (2) energy transactions external to the microgrid will never reduce energy reserves within the microgrid to the point where that microgrid's internal stability is threatened. Likewise, transmission of energy from one microgrid to another over transmission lines must be deliverable to a near 100% degree of certainty.

In response to the CAISO's concerns about the coordination of distribution and transmission planning under a high-DER scenario, the Academy would contend that the ultimate responsibility of the CAISO should be to plan for and serve only the net load at the transmission-distribution interface. However, the CAISO should also be entrusted with regulating microgrid development and operation so that there is overall uniformity and predictability regarding the provision of reliable electric service within its footprint.

B. Emerging Trends that Comprise a "Working Vision" of a High-DER System.

The Academy is in complete agreement with CAISO's identification of emerging trends that will define California's distributed energy system: more choice and control, greater energy management and efficiency, self-optimizing microgrid systems, growing number and diversity of DER resulting in a reduction of MWh volumes on the transmission grid.[2]

C. Specific Criteria for Optimal Location Methodology

The CAISO rightly stresses resource deliverability and effectiveness when addressing microgrids and DER that "wish to provide energy and capacity services to load-serving entities and the CAISO."[3] The CAISO also notes that its "deliverability study process assumes peak load conditions to test whether all the deliverable generation in an electrical area can be dispatched without overloading any transmission facilities," and that the "installation of non-resource adequacy DER (e.g., rooftop residential solar) .

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2 See, CAISO Comments at pages 8-9.

3 See, CAISO Comments at page 10.

. . may in turn reduce the amount of eligible resource adequacy capacity for the system."[4]

With regard to this final observation, however, the Academy would note that under a model microgrid featuring the installation of fuel cell and electrolysis facilities at the substation level, there would be no threat of over-generation from high penetration of rooftop solar, as any and all excess Direct Renewable Energy (*i.e.*, energy generated directly from renewable sources as opposed to energy generated from indirect renewable sources such as hydrogen or biogas) not sold through the transmission grid would be diverted to electrolysis for hydrogen reserves. Under such a scenario, a high penetration of rooftop solar resources would only result in an increase in hydrogen reserves that could either be stored as a strategic reserve, or sold to hydrogen fueling facilities in the emerging market for clean transportation fuels. Conversely, a steady and reliable supply of energy to the transmission grid would be ensured through the load-leveling functions of the fuel cell facility, as well as by frequency regulation services that can be provided by other forms of storage, including batteries, flywheels and super-capacitors.

The Academy would offer the identical observation in response to the CAISO's statement on page 11 of its Comments that ". . . DER capacity in excess of the calculated need may have very little incremental value." Such a concern would not arise in a situation where all excess energy is diverted for various forms of storage.

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4 *Id.*

Similarly, the Academy agrees with CAISO that "[s]cenarios should reflect the full range of operating conditions."[5] However, the CAISO's conclusion that a narrow set of scenarios may require ". . . far more curtailment of DER . . . than was anticipated . . ."[6] would not occur under our microgrid model, in which all excess energy would be diverted for electrolysis into hydrogen. Under this scenario, the only possible need to curtail renewable energy would be in that very rare instance when generation exceeded load demand combined with the processing capacity of the electrolysis infrastructure. This circumstance would be extremely unlikely if the microgrid system is properly designed with forecasts of electrolysis capacity based on minimum load and maximum renewable generation assumptions.

D. Range of DSO Models

The Academy appreciates the CAISO's request for consideration of a spectrum of possible DSO models. Within this range, the Academy's proposed microgrid model would require a DSO more in the model of the "total DSO" scenario, "which would essentially aggregate and coordinate the activity of all customers and DER within each local distribution area and appear to the transmission operator as a single resource at the transmission-distribution substation."[7]

E. Formal "Integrated Grid Roadmap" Plan

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5 See, CAISO Comments at page 12.

6 *Id.*

7 See, CAISO Comments at page 17.

The Academy is in total agreement with the CAISO's suggestion that the CPUC "turn the Integrated Grid Roadmap into a more concrete work plan and consider how to engage industry participants and stakeholders."[8] As the Academy noted in its Opening Comments, the Academy's proposed modular integration of microgrids into the existing grid structure on a substation-by-substation basis will enhance the CAISO's -- and this Commission's -- ability to accelerate the creation of additional microgrids as actual experience in the field is gathered. In addition, by proceeding on a substation-by-substation basis, the CAISO will gain an enhanced capacity to carry out its primary mandate to assure grid reliability and stability.

II. REPLY COMMENTS ADDRESSING THE COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL ("IREC")

The Academy also generally supports the Comments filed in this matter by IREC, and offers the following specific observations in response to those comments.

A. Customer Engagement

The Academy agrees that "the incorporation of improved customer engagement into the DRP process" and "how to engage customers in managing their energy supply and to leverage that engagement" are important considerations that should be included in the scope of the DRP proceedings.[9] In this regard, the Academy would remind the Commission that certain local jurisdictions in the state are already moving forward to develop sophisticated approaches to enhance customer engagement in energy supply

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8 See, CAISO Comments at page 18.

9 See, IREC Comments, at page 2.

management through a program run by the Empowerment Institute (an affiliate of the Academy), known as the Cool City Challenge.[10]

B. Strategic Planning

The Academy also supports IREC's suggestion that the Commission require IOUs to "address both short-term and long-terms strategies in their DRPs" and that IOUs should be required to "incorporate into the DRPs a plan for reporting on their progress towards both their short and long-term goals at regular intervals."[11]

C. Integrated Distribution Planning ("IDP")

Likewise, the Academy supports IREC's IDP framework, whereby "the utility determines the likely DER growth on its distribution system over one year, based on its interconnection queue and other data. By studying aggregate capacity of existing facilities and the hosting capacity of existing equipment, it also determines its available hosting capacity for additional DER."[12]

D. Evolution of Distribution Ownership in Relation to DER Distribution Reliability Services

Furthermore, the Academy strongly supports IREC's statement that the Commission should "consider how to ensure that IOUs recognize the benefits that . . . customer-sited, customer- or third-party-owned DER provide, and offer appropriate

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10 See, http://www.coolcitychallenge.org/. The goal of the Cool City Challenge is to change the game around carbon reduction in cities and provide a viable path forward to address climate change. The Cities of San Francisco, Palo Alto, Davis, San Rafael and Sonoma have already signed on to a citizen engagement process via the Cool City Challenge whereby individual blocks within those cities will take responsibility for the type and amount of energy used by the citizens living in those communities.

11 See, IREC Comments, at page 8.

12 See, IREC Comments, at pages 12-13.

compensation for them."[13] We also agree that "in practice optimal DER performance may be most cost-effectively achieved through IOU ownership in certain instances" in that "[s]ome DER are so closely tied to reliability that direct utility engagement, including potentially ownership, may be required." [14]

IREC's example of an energy storage facility at the substation is apropos of our microgrid model, which features fuel cell and electrolysis components to buffer renewable intermittency within the microgrid and thereby provide a high degree of deliverability to the transmission grid. Under this scenario, the IOU (assuming it is the DSO of the microgrid) would need to exercise a high degree of control in order to effectively utilize this facility.

E. Policy and Performance Guidelines to Develop and Implement DRPs

The Academy is in agreement with IREC's belief that "the current ratemaking paradigm represents a fundamental challenge to the successful integration of DER into distribution system planning,"[15] and that ensuring that "IOUs' cost-recovery and profit incentives are better aligned with California's policy goals is an important objective for incorporating DERs into the distribution system."[16]

F. Additions or Modification to Integrated Grid Framework

13 See, IREC Comments, at page 19.
14 *Id.*
15 See, IREC Comments, at page 20.
16 See, IREC Comments, at pages 20-21.

Finally, the Academy strongly agrees with IREC that customer engagement and environmental and social goals need to be emphasized when developing a more integrated distribution system. Environmental and social goals in particular need to remain at the forefront of all considerations when developing a distributed energy system that will eventually wean itself from all carbon-emitting fuel sources. The future of our society and the environment in which it exists must further manifest itself in the short- and long-term strategic planning suggested earlier by IREC.

What will our society look like 10, 20 years from now? To project that far into the future, the Commission must see the forest from the trees, and part of that forest involves the transformation of our transportation sector from one that is almost completely wedded to the internal combustion engine to one that uses renewable energy. Whether it be battery- or fuel cell-based, moving to a carbon-free transportation system has the potential to place huge stresses onto the current grid system if not planned for adequately.

The Academy therefore urges the Commission to expand its awareness of the variables impacting a distributed energy system and to incorporate into its planning efforts the potential surge when electric vehicles begin to seriously penetrate the transportation sector, and when fuel cell vehicles catalyze the future state-wide availability of renewably sourced hydrogen.

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III. REPLY COMMENTS ADDRESSING THE COMMENTS OF SOLARCITY

The Academy also generally supports the Comments filed in this matter by SolarCity, and offers the following specific observations in response to those comments.

A Elements to Demonstrate DRP Compliance with AB 327 Requirements

The Academy agrees that "[f]irst and foremost, there must be a robust assessment of the costs and benefit yielded by distributed resources across the utilities' respective distribution system" and "that to conduct such a complex analysis, it is critical that the utilities engage with stakeholders to vet their modeling methodology and identify a set of reasonable scenarios and input assumptions to be assessed."[17] Finally, the Academy supports SolarCity's recommendation that "each utility identify any potential or existing conflicts of interests between the Commission's DRP objectives and the utility's shareholders,"[18] although we believe that it is the Commission's ultimate responsibility for identifying and resolving any such conflicts.

B. Criteria for Calculating Optional Locations for DERs

The Academy fully agrees with SolarCity's assessment that "any methodology . . . should translate into an incentive for customers to deploy DERs in high value areas, not as a basis to discriminate against customers living in areas with lower locational benefits. Protecting a customer's ability to install DERs is critical to maintaining a customer's right to manage his or her personal energy portfolio. Consumer choice should not be constrained by a cumbersome centralized resource planning process, and a customer's

17 See, SolarCity Comments, at page 3.

18 See, SolarCity Comments, at page 5.

ability to invest in DERs should not be constrained in any way by a utility's distribution planning process."[19]

Using the Academy's microgrid solution, featuring a fuel cell and electrolysis facilities as a buffering component, every electron generated from renewable sources can be used in some capacity, either (i) directly applied to the microgrid's daily load requirements, (ii) diverted for electrolysis and storage or (iii) exported to other microgrids within the state or outside states via transmission lines. Given that a customer's first priority is to install DERs to reduce personal load requirements and stress on the grid, their decision to increase a DER system's capacity should always be valued, and a utility, as the DSO of a microgrid, should take measures to ensure the proper utilization of such additional energy.

C. Development of a DER Locational Value Calculus

The Academy could not agree more with SolarCity's assessment that "a new methodology that calculates optimal DER should reflect the full costs of meeting distribution level reliability needs, including services like reactive power for voltage support, and the system resiliency benefits associated with DER. . . . A resource's ability to meet load in a given distribution area during a range of contingency events provides significant benefit to customers, which should be captured in any calculation regarding optimal locations."[20]

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19 *Id.*

20 See, SolarCity Comments, at pages 6-7.

The Academy's proposed microgrid network is entirely consistent with this idea. By installing adequate fuel cell and electrolysis infrastructure, and using excess renewable energy to create hydrogen reserves within the local distribution area, a microgrid becomes virtually "bullet-proof" and is able to weather extended periods of grid dislocation or shortages due to sub-optimal conditions. While some may have difficulty in assigning a value to such a proactively designed system, the importance of this value will become very clear to customers when such disruptive events (*e.g.*, the recent San Diego grid outage) do occur.

D. Considerations/Methods to Support DER Integration

The Academy agrees with SolarCity that small residential/commercial DER should be treated as load modification (*i.e.*, grid stress reduction) rather than as generation, as well as that "[i]n order to support customer choice in personal load management decisions, utilities should proactively plan for DER growth just as they plan for load growth."[21]

E. Specific Methods to Support DER Distribution Reliability Services

The Academy agrees with SolarCity's observation that "[s]ince operational conditions are specific down to individual feeders, IOUs will need to assess their capability to plan for DER utilization by substation and feeder."[22] The Academy's microgrid model is centered on the substation as the nexus point between distribution and transmission grids, so our analysis would be similarly situated.

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21 See, SolarCity Comments, at page 8.

22 See, SolarCity Comments, at page 9.

F. Criteria/Inputs for Scenarios/Guidelines to Test DER Integration

The Academy agrees with SolarCity's proposal to use multiple scenarios, differentiated according to short and long-term planning periods. The Academy believes that long-term planning considerations are especially important, since "short-sighted" planning can potentially lead to false starts or selection of technologies that may not deliver in the long term.

G. Considerations when Monitoring DRPs over Time

As recommended by SolarCity and others, it is crucial that the Commission require that DRPs be revisited on a periodic basis "and include both an independent evaluation/assessment of the utilities' success in implementing the plans as well as a refresh of the underlying analyses."[23] As suggested by SolarCity, more frequent quarterly meetings for DRP working groups should also be required so that appropriate adjustments to DRPs can be made on an ongoing basis.

H. Safety Concerns in DRPs

The Academy is in full agreement with SolarCity's belief that "a more distributed approach does not inherently pose any greater safety issues than the current more centralized approach and in fact may be superior in a number of respects."[24] The Academy's only recommended modification to this statement would be to change "may be" to "is." The Academy would also note in this regard that a more distributed electricity system relying to a significant degree on microgrids will be dramatically less

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23 See, SolarCity Comments, at page 12.

24 See, SolarCity Comments, at page 14.

vulnerable to acts of terrorism than the current highly centralized grid.

IV. REPLY COMMENTS ADDRESSING THE COMMENTS OF VOTE SOLAR

The Academy also generally supports the Comments filed in this matter by Vote Solar, and offers the following specific observations in response to those comments.

A. Criteria Necessary to Enable the Achievement of California's Energy and Climate Goals

The Academy agrees with Vote Solar's emphasis on providing customer access to DERs and the three goals of: "(1) facilitating and expanding customer choice; (2) promoting DER development in locations that have lower integration cost; and (3) considering DERs as an alternative to transmission and distribution ("T&D") upgrades and expenditures."[25]

B. Criteria for Calculation Optimal DER Location

The Academy agrees with Vote Solar's analysis using criteria based on "Customer Responsiveness," "Low-Cost Integration" and "Benefits Maximization."

C. Considerations/Methods to Support DER Integration

The Academy also agrees that "periodically updated forecasts of customer DER adoption rates" and that "these forecasts would be location or region-specific, as opposed to general and system-wide."[26] The Academy further agrees that "[t]hese adoption rates should be used in load forecasts, which, in turn, should play a significant role in IOU distribution plans. *DERs should be considered as alternatives to IOU system expansions*

[25] See, Vote Solar Comments, at page 3.

[26] See, Vote Solar Comments, at page 3.

in distribution planning." [Emphasis added.][27]

D. Planning and Operations to Support DER Distribution Reliability Services

The Academy strongly endorses Vote Solar's example of Hawai'i to contend that "when customers must pay for the costs of distribution upgrades to accommodate DER systems, the DER-integration process can grind to a halt. A utility's determination that an upgrade is necessary can effectively close circuits to DERs because DER customers are not inclined to pay for upgrades that may benefit other grid users. However, advanced inverter functionality, voltage-regulation equipment, energy management systems and energy storage can avoid the need for expensive distribution upgrades, allowing customers, IOUs and developer to pursue simpler, lower-cost, customer-based DER solutions that also provide beneficial distribution reliability services."[28]

E. Benefits When Quantifying DER Integration Value

The Academy further agrees that "[i]n considering DERs as an alternative to IOU system expansion, the benefits of implementing DERs are well established. They include avoided line losses, avoided or deferred generation and T&D capacity, avoided or deferred T&D upgrades, and various economic, environmental and public health benefits."[29]

F. Types of Data and Access as Part of the DRP

As previously mentioned, the Academy agrees that "regularly updated forecasts of

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27 *Id.*

28 See, Vote Solar Comments, at page 8.

29 See, Vote Solar Comments, at page 9.

customer DER adoption rates" are an important element of the DRP planning process.[30] The Academy also concurs that "[a]reas where DER integration would yield the highest value will almost certainly change over time. Utilities should identify those areas on maps and update that information regularly."[31]

G. Actions to Establish Policy and Guidelines to Develop and Implement DRPs

The Academy additionally agrees with Vote Solar that "[i]t is very likely that additional investments in the distribution grid will be necessary in order to accommodate the expansion of DERs. Vote Solar believes that these investments can and should be offset by reductions in new generation and transmission capacity, and that the Commission should oversee the process of achieving this outcome."[32]

The Academy also agrees that the IDP process articulated in the Integrated Distribution Planning Concept Paper from IREC and Sandia National Laboratories should be considered developing a proactive plan for DG growth and distribution system upgrades.

V. REPLY COMMENTS ADDRESSING THE COMMENTS OF MARIN CLEAN ENERGY ("MCE")

Finally, the Academy also generally supports the Comments filed in this matter by MCE. In particular, the Academy appreciates the "three fundamental criteria listed by

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30 See, Vote Solar Comments, at page 10.

31 *Id.*

32 See, Vote Solar Comments, at page 13.

which the Commission should judge the IOUs' DRPs: transparency, competitive neutrality and ease of access to data, billing and interconnection."[33]

With respect to competitive neutrality, the Academy also strongly endorses the following statements of MCE: "Competitive neutrality must be a cornerstone of the DRPs and of the Commission's program for enhancing access to new distributed energy resources. *Above all, the Commission must ensure that no one participant may stifle or supplant the participation or innovation [of] any other participant*."[34] [Emphasis added.] "If the Commission wishes to ensure the development of utility DRPs that reflect the vast scope of potential change occurring in the industry then it must make a fundamental commitment to facilitating and fostering the participation of a wide range of stakeholders in the provision of DERs. In essence, the IOUs in their role as distribution utilities must facilitate non-distribution resources."[35]

VI. CONCLUSION

The purpose of the foregoing Reply Comments is simply to indicate where the Comments filed by other key parties to this proceeding are consistent with, and support, the positions articulated by the Academy in its September 5 Opening Comments in this proceeding. Accordingly, the Academy respectfully requests that the Commission take the foregoing Reply Comments into account as it moves forward to determine the scope of this proceeding and to provide guidance to its regulated utilities

33 See, MCE Comments, at page 7.
34 *Id.*
35 See, MCE Comments, at page 9.

on the key criteria that should guide the development of the utilities' respective DRPs.

Respectfully submitted,

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